informal work could provide a useful starting point for the preparation of annexes to the framework convention concerning research and systematic observation and information exchange.

Assessment and Consideration of Response Measures

Specific commitments for emissions reductions should not be included in the framework convention, because of the need for flexibility in nations' choices of their own measures. Further, there is a real need for further analysis of the costs and benefits of international responses, at the same time that prudent steps may be taken by nations even in the face of great uncertainty. Accordingly, the framework convention should include an article on assessment and response measures that is modelled on Article 6 of the Montreal Protocol on Substances that Deplete the Ozone Layer and that requires the Parties to periodically assess the available scientific, technical, and economic information with respect to:

(a) greenhouse gases and their precursors and their effects on climate;

(b) the possible impacts of such effects; and

(c) possible response measures that could be taken at the national, regional, and/or international levels.

As part of this work, the Parties should be required, as necessary, to update and to make public, using a standardized methodology developed in light of the work of the IPCC and other competent international bodies, national inventories of all sources and sinks of greenhouse gases and their precursors.

In light of this work, the Parties would be obligated:

(a) to update national, regional, and international strategies and policies to limit, reduce, facilitate adaptation to, and as far as appropriate, to prevent the adverse impacts of climate change, in accordance with the provisions of the convention and any subsidiary instrument;

(b) to update programs for research, systematic observation, information exchange, and the development and transfer of technology and knowledge;

(c) to consider and undertake any additional action that may be appropriate in light of the purposes of the convention.

In the assessment and consideration of response measures, and in particular, in the development of national, regional and

international response strategies, the Parties should take into account the best available GWP. In addition, the Parties should consider, in consultation with the IPCC and other relevant international bodies, whether the GWP should be revised at some future date.

Development and Transfer of Technology

Article 4(2) of the UK draft convention addresses the development and transfer of technology and is generally acceptable. It provides that the Parties, consistent with their national laws, regulations and practices, shall cooperate in promoting, directly or through competent international bodies, the development and transfer of technology and knowledge relevant to scientific and technical research. The UK draft provides for such cooperation through the supply of necessary equipment and facilities for research and monitoring and through appropriate training of scientific and technical personnel.

Settlement of Disputes and Compliance

We note the suggestion in the IPCC Legal Measures paper that dispute settlement provisions similar to those in the Vienna Convention for the Protection of the Ozone Layer might be employed in the framework climate convention. This suggestion is reflected in Article 11 of the UK draft convention and in Annex III thereto. We believe that it is important that all Parties comply fully with the obligations that they undertake in the framework convention and any subsidiary instrument thereto. Dispute settlement provisions are one means of achieving such objective, as are other mechanisms, such as the compliance procedures developed by the parties to the Montreal Protocol. To be most effective, however, such procedures and mechanisms should be tailored to specific obligations contained in a given agreement. Accordingly, these questions should be considered after the INC has reached agreement on the substantive obligations to be included in the framework convention.

Final Clauses

The final clauses contained in the UK draft convention (Articles 8-10 and 12-21) are generally acceptable. However, we believe that the procedures for entry into force of protocols, amendment of protocols, and withdrawal from protocols, as well as the provisions relating to the proposal, adoption, and entry into force of annexes to protocols, should be left to any such protocol. This would permit the Parties to tailor those provisions to any particular protocol.

PAPER NO. 12: SCIENTISTS FROM A WIDE RANGE OF DELEGATIONS

February 14, 1991

Inventory on Research, Systematic Observations, Assessments and Information Exchange

During the first meeting of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC) in Washington, 4-14 February 1991, scientists from a wide range of delegations, representing natural and social sciences, met informally to compile an Inventory of priority needs for research, systematic observations, assessments and information exchange, which at a later stage could contribute to drafting language for the Preamble, Articles and/or Annexes of the Convention or related legal instruments.

The following individuals/countries were represented in the ad hoc non-group meeting:

A. Baede (chair)	Netherlands
M. Vanderstraeten	Belgium
D. Russell	Canada
H. Hengeveld	Canada
S. Shim	Korea
P. Melnikov	USSR
J. Shiino	Japan
M. Perdomo	Venezuela
L. Balairon	Spain
W. Kininmonth	Australia
J. Von Dadelszen	New Zealand
J. Labrousse	France
A. Kulmala	Finland
A. Sutera	Italy
J. Luo	China
J. Poncelet	Belgium
L. Meira	Brazil
P. Bakken	Norway
M. Rochas	France
A. Speranza	Italy
I. Droghici	Romania
R. Godin	UNESCO/IOC
S. Kirby	Canada
K. Cunliffe	New Zealand
D. Phantumvanit	Thailand
R. Watson	USA
D. Albritton	USA
V. Baldirev	WMO
J. Pershing	USA
M. Yerg	WMO
H. Gruenspecht	USA

All countries are invited to contribute to any future elaborations of this Inventory.

In particular these scientists felt that an Annex on Research and Systematic Observations would:

* underscore the role of research and systematic observations in providing the scientific and economic basis for policy decisions,

* outline the priority areas of scientific, technical and economic research needed to support decision making,

* provide the means to:

  (i) address the special research and technical training needs of developing countries,

  (ii) promote broad co-operation among national and international research programmes, and

  (iii) state the requirements for regular scientific and economic assessments.

It should be stressed that this Inventory or the corresponding language in the Convention would not in itself initiate research programmes nor replace the IPCC-process, but rather would form the basis for Parties or competent international bodies to carry out such activities.

It should moreover be stressed that the present Inventory is incomplete and that in particular paragraphs 6-11 require further elaboration.

This Inventory has been made available to the Secretariat of the INC.

Annex I: Inventory.

Annex I - Draft: February 13, 1991

Inventory on Research, Systematic Observations, Assessments and Information Exchange

1. Goal Statement: The goal is to establish a basis for the Parties to initiate and cooperate in, directly or through competent international bodies, the conduct of research, systematic observations and scientific assessments related to natural and anthropogenic changes in the global climate system. To achieve this the following objectives should be borne in mind:

   a. Better understanding of the climate systems, including:

      i. improving climate observing systems and data exchange;

      ii. conducting research into physical, chemical, biological, geological, social, and economic processes affecting climate; and

      iii. improving climate prediction at regional and global scales;

   b. Better understanding of the global, regional and local impacts of climate changes, including:

      i. improving environmental observing systems for this purpose;

      ii. conducting research into physical, chemical, biological, geological, social, and economic processes affected by climate; and

      iii. improving prediction of climatic impacts at regional and global scales;

   c. Further developing methodologies for mitigation and adaptation to climate change.

2. Identifying the priority needs (in no particular order) for research and systematic observations required to understand the climate system including:

   a. GHGs, aerosols and precursors:

      i. anthropogenic and natural sources and sinks;

      ii. abundances and trends;

iii. radiative properties;

b. Atmospheric radiation, heat and water budget:

i. role of clouds and water vapor;

ii. precipitation;

iii. solar radiative input and atmospheric transmission;

iv. surface albedo;

c. Oceanic systems:

i. ocean dynamics;

ii. ocean/atmospheric interaction;

iii. sea-level changes;

d. Terrestrial systems:

i. surface and sub-surface hydrological processes;

ii. land-surface/atmosphere interactions;

e. Cryosphere:

i. permafrost;

ii. polar ice sheets;

iii. sea ice;

iv. glaciers;

f. Economic and social systems:

i. influence of economic growth on the climate system

ii. influence of technology and practice in a wide range of sectors (including, for example, energy, agriculture, and industry) on the climate system ;

iii. influence of social systems on climate;

3. Identifying the <u>research and systematic observations</u> needed to <u>evaluate local, regional and global impacts of climate change,</u> including:

a. Natural ecosystems and resources including biological diversity:

   i. terrestrial ecosystems;

   ii. aquatic ecosystems;

   iii. coastal ecosystems;

b. Managed ecosystems:

   i. agriculture;

   ii. fisheries;

   iii. forestry;

c. Water resources;

d. Coastal environments;

e. Social systems and economics:

   i. human health;

   ii. standard of living;

   iii. social and economic impacts;

   iv. social institutions;

   v. human population dynamics;

   vi. built environment and infrastructure;

f. Valuation of impacts

4. Identifying the research needed <u>to develop methodologies on mitigation and adaptation to climate change</u>, including:

a. Reducing sources and increasing sinks of GHGs through:

   i. technological innovation (particularly with respect to production and consumption of energy);

   ii. improving forestry and agricultural practices;

   iii. investigating economic and other instruments;

iv. improving education and public information techniques;

b. Developing methods to adapt to a changing climate by:

i. understanding natural and managed ecosystem adaptation;

ii. developing methodologies to protect the coastal environment and to defend low-lying countries against rising sea level;

iii. stimulating social adaptation;

iv. improving education and public information techniques;

c. Addressing methodological issues relevant to the assessment of the costs and benefits of adaptation and mitigation responses;

d. Researching the costs, benefits and social consequences of response strategies;

i. examining how changes in the timing or magnitude of climate change alter its impacts;

ii. examining the direct and indirect links between responses and economic activity, including trade;

iii. examining distributional implications of responses within and across economies;

5. Integrated modeling and climate prediction:

a. Developing, improving, and validating models of social activities, climate processes and impacts;

b. Improving parameterization of processes involved (including, chemical, physical, biological, geological, social and economic);

c. Evaluating the predictability of climate;

6. Developing a Global Climate Observing System (GCOS) (text may be similar to that contained in the SWCC Conference Statement);

7. Approaches to standardized data sets and data information systems;

8. Enhancing the full and open exchange of data and information and the systems that accomplish this;

9. Role of national and international organizations;

10. Periodic comprehensive scientific, technical and socio-economic assessments;

11. Cooperation among developed and developing countries, taking into account the particular needs of the latter (text may be similar to that contained in the SWCC Conference Statement)